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ABSTRACT

The results from application of Stufflebeam's comprehensive decision-making methodology--the context-input-process-product (CIPP) evaluation model--to the evaluation of a dental team training program with expanded functions of auxiliary personnel (paraprofessionals) at a school of dentistry are described. In view of the expectations of health care on the part of the American public, this training program was aimed at enhancing the capabilities of the dental profession to serve a large public at lower cost and with greater efficiency without a reduction of quality in service. Thus for this innovative training program, it appeared essential to delineate, obtain, and provide useful information for: (1) planning decisions regarding appropriate change-oriented objectives based on a rationale of needs (facilitated by context evaluation), (2) structuring decisions concerning a choice of alternative designs, strategies, and procedures for conducting the program (served by input evaluation), (3) implementing decisions pertaining to carrying out and monitoring the program design and strategy (directed by process evaluation), and (4) recycling decisions concerning whether to continue, terminate, modify, or refocus the change activity (aided by product evaluation). (Author)

THE APPLICATION OF THE STUFFLEBEAM EDUCATIONAL DECISION-MAKING MODEL TO THE EVALUATION OF A DENTAL TEAM TRAINING PROGRAM INVOLVING USE OF PARAPROFESSIONALS

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Purpose. The purpose of the paper is to describe the results from application of Stufflebeam's comprehensive decision-making methodology--the context-input-process-product (CIPP) evaluation model--to the evaluation of a dental team training program with expanded functions of auxiliary personnel (paraprofessionals) at the School of Dentistry of Loma Linda University. In view of heightened expectations of health care on the part of the American public, this training program was aimed at enhancing the capabilities of the dental profession to serve a larger public at lower cost and with greater efficiency without a reduction of quality in service. Thus for this innovative and hopefully exemplary training program, it appeared essential to delineate, obtain, and provide useful information for (a) planning decisions regarding appropriate change-oriented objectives based on a rationale of needs (facilitated by context evaluation), (b) structuring decisions concerning a choice of alternative designs, strategies, and procedures for conducting the program (served by input evaluation), (c) implementing decisions pertaining to carrying out and monitoring the program design and strategy (directed by process evaluation), and (d) recycling decisions concerning whether to continue, terminate, modify, or refocus the change activity (aided by product evaluation).

CONTEXT EVALUATION
(Planning Decisions)

Evidence of needs and opportunities.

A major problem that has existed in dentistry for some time is that the profession has not effectively utilized dental auxiliaries to maximize efficient use of the dentist's time and skills. The medical profession has for many years recognized the need for well-qualified assistants who perform highly technical and exacting tests, as well as a great many direct treatment services. Dentistry, on the other hand, has been slow to move in the training and use of paraprofessionals, even though the present dentist-to-population ratio is approximately 1:2,000 in the United States.

Response to the need.

In 1967, the President's National Advisory Commission on Health Manpower stated that the dental profession could only meet its commitment to the public

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through more effective use of auxiliaries (American Dental Association, 1970). Every comprehensive analysis of the United States health manpower situation has been in agreement on that point because it is obvious that neither increasing the number of dental students nor utilizing new materials and techniques, preventive dentistry, or conventional auxiliaries will solve the problem of providing dental services to the increasing population of those who demand efficiency and economy. Therefore, the Public Health Service in 1971 developed the TEAM (Training in Expanded Auxiliary Management) Program with the intention of training dental students in the organization and management of a dental practice which uses the "team" approach for the delivery of quality dental health care.

In the light of the needs assessment that was done, both through interviews and a substantial review of the literature, a context evaluation afforded a basis for making decisions regarding what the goals and objectives of the TEAM training program should be.

Preliminary goals of TEAM.

These seven broad objectives were that prior to the completion of his training with TEAM, each dental student will:

1. Provide evidence of ability to control quality of the TEAM product.
2. Demonstrate knowledge of the skills required of auxiliaries performing expanded duties.
3. Evaluate level of performance of auxiliary personnel.
4. Provide evidence of interpersonal skills for optimum operation of the team.
5. Receive feedback from patients relative to their attitudes.
6. Demonstrate knowledge of and ability to apply basic principles of facilities and equipment design.
7. Demonstrate efficient managerial ability with his team that results in a financial break-even level of remuneration to simulate actual private practice conditions.

INPUT EVALUATION

(Structuring Decisions)

In providing information for structuring decisions concerning which of several alternative designs and strategies could be used in program development, attention had to be given to (a) legality of the TEAM approach, (b) existing programs involving limited, but legal, uses of dental auxiliaries (known as Dental Auxiliary Utilization [DAU] Program), (c) development of a synthesis of existing job descriptions of auxiliaries and dental hygienists, (d) the allocation of human and physical resources including utilization of staff and instrumental materials within the constraints of funding and performance competencies, (e) the design of appropriate instruments for evaluation, and (f) the results of pilot studies. It was noted that managerial capabilities are required for both DAU and TEAM with expertise in practice management becoming more essential as the individual dental student learns to work in co-operation, first with one auxiliary (DAU) and then with multiple auxiliaries (TEAM).

Characteristics of the TEAM Program.

On the basis of information provided from input evaluation, structuring decisions were made concerning what the design of the TEAM Program would be. Space allocations include facilities for two teams which operate in the TEAM area of the Loma Linda University, School of Dentistry clinic and make use of the x-ray room. These teams function in eight dental operatories designed in the bay concept (Appendix A) in which each of two senior dental student operators can observe and manage the function of his six full-time equivalent auxiliaries (Appendix B).

Student selection for TEAM experience is limited to those senior students who have completed three years of the dental curriculum, which includes two years of clinical experience and to those who are proficient in the practice of DAU principles.

TEAM Program evaluation plan, on the basis of decisions derived from input evaluation, consists of two major parts: (a) ongoing assessment of the qualitative and quantitative performance of the total team, including the dental student and all auxiliary personnel, as well as of the attitudes of patients toward receiving the experimental dental services, and (b) productivity during simulation conditions of projected TEAM private practice with the minimal financial goal of a break-even level. This approach allows inferences to be drawn regarding the team's efficiency levels and production capacity. In addition, observations are recorded regarding the nature and effectiveness of the consultative process between dental student and all auxiliaries as they share responsibility for patient care. Thus input evaluation served to afford plans for both process and product evaluation to be described subsequently in greater detail.

Illustrative job descriptions. Instead of limiting auxiliary personnel to their traditional role which included preparation of instruments, ordering supplies, performing secretarial and accounting duties, and conventional chairside assisting, the TEAM approach to dentistry promotes direct treatment services to patients such as having the EDDA (Expanded Duties Dental Assistant) perform the following intra-oral procedures:

1. Place and remove rubber dam.
2. Take preliminary alginate impressions.
3. Retract tissue for final impressions.
4. Take rubber base final impressions.
5. Prepare, place, and remove all types of temporary restorations.
6. Condense, carve, and polish amalgam restorations.
7. Place and remove surgical dressings.
8. Administer fluoride treatments.
9. Remove sutures.
10. Assist dentist at chair during the irreversible procedures.
11. Administer local anesthesia (infiltration and nerve blocks).
12. Adjust fixed restorations prior to cementation (i.e. crowns).

The TEAM dental hygienist is responsible for the following functions:

1. Dietary analysis.
2. Preliminary charting.
3. Preliminary history.
4. Taking of radiographs.
5. Preliminary impressions.
6. Instruction of patients in plaque control.
7. Application of topical fluorides.
8. Coronal debridement, subgingival scaling, root planing, polishing.
9. Assessment of oral hygiene, reinstruction as indicated.
10. Administration of topical anesthetics, infiltration, nerve blocks.
11. Minor periodontal surgery.

Note: The hygienist's assistant will usually perform items 1-4, with the hygienist placing her emphasis on items 5-11.

PROCESS EVALUATION

(Implementing Decisions)

The process evaluation served to provide information regarding a number of the following characteristics so that decisions could be made regarding alternative courses of action that could be taken to maintain and improve the quality of the program: (a) determination of strengths and weaknesses of participants in both technical competencies and human relations-management skills at various time periods as revealed by data from observation scales, (b) comparison of scheduled attainments with actual attainments on a daily and/or weekly basis, (c) extent to which facilities, instructional materials, and supplies were being used in prescribed ways and amounts, (d) the degree to which the roles of participants were understood and being implemented, as well as the degree to which misunderstandings about job function and responsibilities existed to the detriment of realizing program objectives. On the basis of information obtained from process evaluation, particularly in relation to nearly simultaneous product evaluation, adjustments were made in the specificity of task requirements for the student manager of the TEAM and his personnel, as well as in the modification of existing instrumentation and in the design of new instrumentation for evaluation of ongoing TEAM activities. An important outcome of process evaluation was the decision that relatively greater emphasis needed to be placed on the development of human relations and management skills relative to efforts that had been spent on clinically-oriented procedures and techniques of dentistry.

PRODUCT EVALUATION

(Recycling Decisions)

Preliminary information from performance criterion scales and from various observation scales obtained at the terminal points of training sessions for various teams has indicated: (a) paraprofessionals are capable of a level of success in a variety of dental procedures comparable to that realized by dental students, (b) considerable room exists for the improvement of interpersonal

skills on the part of most members of the TEAM--a point also reinforced by the reports of patients on attitude scales, (c) favorable cost-effectiveness data have suggested that increased productivity in dental services without a loss in quality is probably possible when auxiliaries are properly trained and supervised, (d) in conjunction with process evaluation, information associated with product evaluation revealed a need for criterion-referenced types of data to maintain and improve the quality of the clinically-related outcomes of dentistry.

CONCLUSION

On the basis of preliminary evidence obtained from the TEAM Program at Loma Linda University, School of Dentistry, two major conclusions seem apparent:

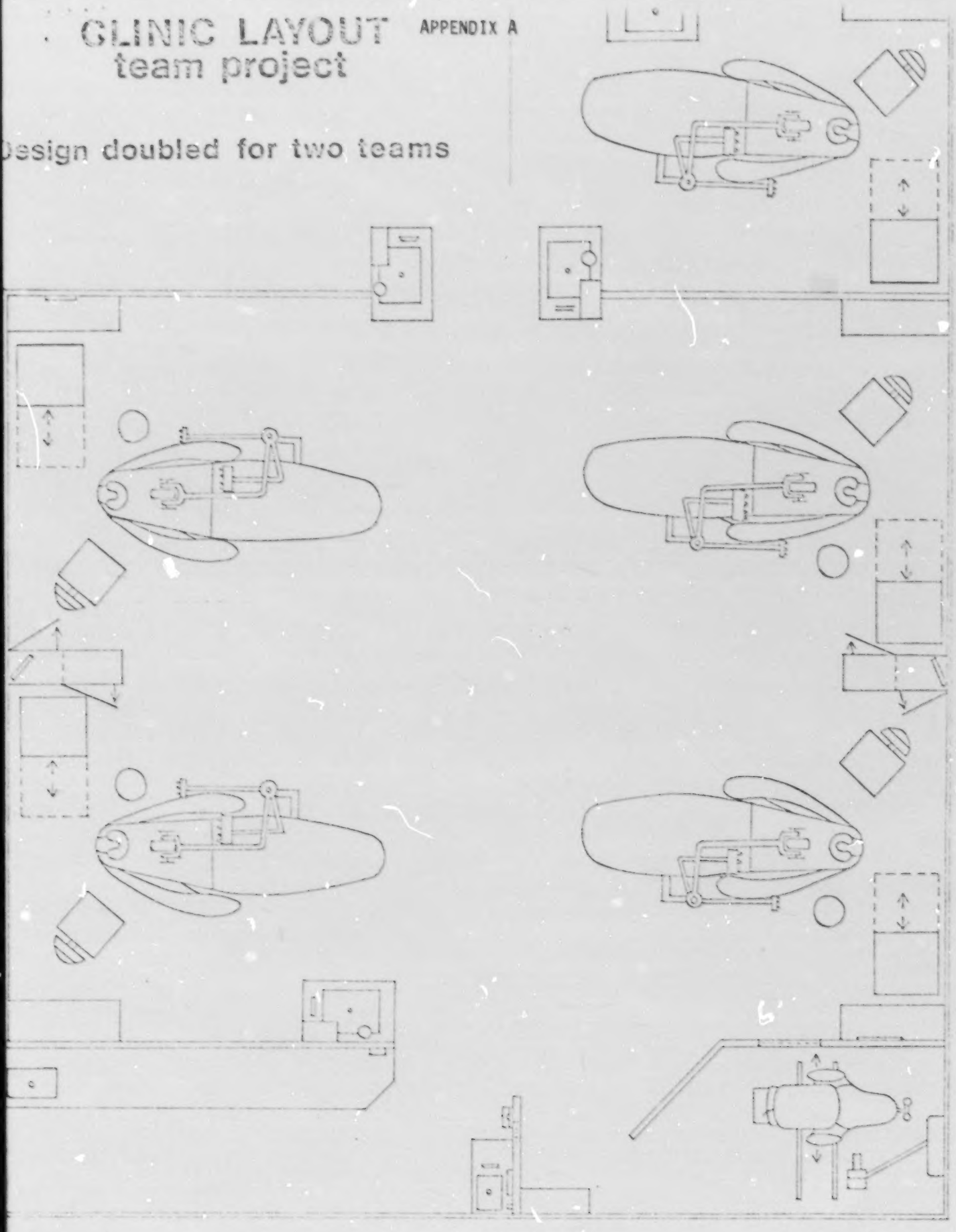
1. The CIPP model affords a useful and viable evaluation methodology to the determination of information required in making important decisions in planning, structuring, implementing, and recycling activities involved in a TEAM program.

2. From a substantive standpoint, application of the CIPP model has furnished preliminary evidence that a TEAM approach to dentistry involving the use of paraprofessionals holds promise for extending needed dental services of a high level of quality to a much broader group of recipients than is now being served by the dental profession.

GLINIC LAYOUT
team project

APPENDIX A

Design doubled for two teams



APPENDIX B

Team Program Organizational Chart